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*Andrew Gersey*

Dated

25 March 1999



# Request for grant of a patent

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1. Your reference	DCM/HMC/JM/P08191GB		
	THE PATENT OFFICE F		
2. Patent number (The 1)	9806359.7	26 MAR 1998	26 MAR 1998
3. Full name, address and postcode of the or of each applicant (underline all surnames)	DEVRO-TEEPAK LIMITED MOODIESBURN, CHRYSTON SCOTLAND G69 0JE		
Patents ADP number (if you know it)	7405129001		
If the applicant is a corporate body, give the country/state of its incorporation	UNITED KINGDOM		
4. Title of the invention	TRUSSING		
5. Name of your agent (if you have one)	CRUIKSHANK & FAIRWEATHER		
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)	19 ROYAL EXCHANGE SQUARE GLASGOW G1 3AE		
Patents ADP number (if you know it)	ADP 547002 ✓		
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	-	-	-
7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application		Date of filing (day / month / year)
	-		-
8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:	YES		
a) any applicant named in part 3 is not an inventor, or			
b) there is an inventor who is not named as an applicant, or			
c) any named applicant is a corporate body.			
See note (d))			

**Patents Form 1/77**

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Continuation sheets of this form

Description 9

Claim(s) -

Abstract -

Drawing(s) 2

10. If you are also filing any of the following, state how many against each item.

Priority documents -

Translations of priority documents -

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*) -

Request for preliminary examination and search (*Patents Form 9/77*) -

Request for substantive examination (*Patents Form 10/77*) -

Any other documents -  
(please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature

*CruiKshank & Fairweather*

Date

CRUIKSHANK & FAIRWEATHER

25.03.98

12. Name and daytime telephone number of person to contact in the United Kingdom MR DONALD C. MacDOUGALL 0141-221-5767

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### Trussing

The present invention relates to a truss, particularly though not exclusively, for binding the legs of a bird together.

It is desirable to truss or bind the legs of a bird or fowl together before cooking. This provides the bird with an attractive appearance, making the bird more appealing to customers at the point of sale.

Traditionally, trussing is performed manually using an elastic band or twine to truss the legs to the tail. The process, however, is labourious, time-consuming and leaves operators vulnerable to repetitive strain injury.

A further disadvantage is that materials traditionally used for trussing such as twine and rubber are inedible. Food regulations may also require the product to be additionally labelled to warn consumers of the presence non-edible materials.

It is an object of the present invention to provide an edible truss which may be applied by a semi-automated process to bind the legs of a bird together.

According to a first aspect of the present invention, there is provided a truss for binding the legs of a bird together, the truss being formed of an edible material and applied above the hocks such that the hocks are crossed and held together against the breast of the bird, and in proximal but spaced relation to the tail of the bird.

In a preferred embodiment, the truss is formed from an edible composite material comprising one or more of the

following materials: collagen, cellulose and alginate. In an alternative embodiment, the truss is formed of collagen casing which is slit and twisted. Preferably, the truss is formed of a material which is chicken skin coloured.

Advantageously, the truss is maintained in position and in close contact throughout its length with the moist surface of the bird. This prevents the truss from becoming dry and/or brittle during cooking. Conveniently, the truss is formed of a material which, on cooking, becomes crisp, turns a golden colour and absorbs the full flavour of the cooked bird.

The truss may be applied as a single loop but is preferably applied as a double loop. Advantageously, the truss is knotted as an overhand knot positioned between the hocks of the bird.

The truss of the present invention provides the bird with a symmetrical appearance, making the bird attractive to customers at the point of sale. The legs of the bird are held securely together by applying the truss above the hocks. The truss also ensures optimal bird conformation and ensures that the legs are held in a position close to the keel of the bird. This minimises the risk of "tenting" i.e. the unsightly appearance of taut skin between the breast and thigh, leading to skin splitting.

By positioning the legs close to the breast of the bird, the breast of the bird is provided with a plump and high appearance. The close proximity of the legs to the breast also ensures that the breast meat remains moist

after cooking. These advantages are lost if the legs are trussed to the tail of the bird. By including the tail in the truss, the legs are not held as closely to the breast. Thus, the breast loses its plump and high appearance, is more exposed, and becomes susceptible to moisture-loss during cooking.

According to a second aspect of the present invention there is provided a method of trussing the legs of a bird together, the method comprising the steps of:

positioning the legs of the bird close against the breast of the bird,

arranging the hocks of the bird in a crossed configuration,

applying a truss formed of an edible material above the hocks of the bird such that the hocks are held together against the breast of the bird and in proximal but spaced relation to the tail of the bird.

Preferably, the method further comprises the step of tying the truss with an overhand knot positioned between the hocks of the bird.

Once trussed, the birds may be pumped and/or cartonised. During cartonisation, it is advantageous to ensure that rigor mortis is achieved with the legs of the birds against the breast. Thus, the birds are preferably arranged with their legs downwards, with adjacent birds supporting each other during transit.

The method of the present invention may be used to truss the legs of a bird tightly together, allowing the

bird to be loaded into an oven or combi-steamer by automatic means. For example, the birds may be positioned in an oven by an epigastric vent without fear of the truss becoming detached from the bird.

These and other aspects of the present invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a truss in accordance with a preferred embodiment of the present invention,

Figure 2 is an enlarged view of the region labelled A of Figure 1, and

Figure 3 is a perspective view of an operator applying the truss of Figure 1 by semi-automatic means .

Reference is first made to Figures 1 and 2 which depict a truss 10 applied above the hocks 12 of a chicken 14. The truss 10 is applied as a double loop around a region above the hocks 12 and is secured by an overhand knot 16.

The truss 10 is maintained throughout its length in close contact with the moist surface of the chicken 14. This prevents the truss 10 from becoming dry and brittle during cooking.

The hocks 12 are positioned in a crossed configuration, and are centrally located a small distance above the tail 18 of the bird. Thus, the legs 20 of the chicken 14 are held firmly against the chicken's breast 22, providing the breast 22 with a high and plump appearance.

The close contact between the legs 20 and breast 22 of the chicken 14 also prevents the chicken meat from drying-out during cooking.

Thus trussed, the chicken 14 has a symmetrical appearance, making the bird 14 more attractive to customers at the point of sale.

Reference is now made to Figure 3 of the drawings which depicts an operator applying the truss of Figure 1 to a chicken 14 using a trussing machine 100.

The trussing machine 100 comprises a tying deck 110 and an orifice 112, which is adapted to receive the lower leg portions of a chicken. When the legs of the chicken are positioned within the orifice 112 accordingly, a truss is applied automatically as a double loop around a region above the hocks and secured by an overhand knot (not shown).

To apply the truss, a chicken 14 is positioned on the tying deck 110, with the breast of the chicken uppermost, the legs held closely to the breast and one leg of the chicken crossed beneath the other. As best seen in Figure 3, the chicken 14 is held at a prone-oblique angle, inclined towards the orifice 112.

Once the truss is applied, the chicken 14 is removed from the orifice 112 and pumped and cartonised, as required.

Certain characteristics of the truss will now be described in further detail with reference to the following examples.

Example 1

In this example, eighty number 12 chickens were trussed in accordance with the preferred embodiment of the present invention. Once trussed, the chickens were pumped according to standard supermarket specifications. The truss ensured that the chicken legs were bound securely together: only one leg became detached during pumping.

Example 2

In this Example, twenty of the birds of Example 1 were lifted by their legs and loaded into an oven for roasting. The trusses were resistant to damage: all the trusses remained intact during handling.

The birds were placed in the oven for a 60 minute cook cycle. A core temperature of above 86°C was achieved.

Once cooked the birds had a crisp, golden appearance.

Example 3

The appearance of the birds of Example 2 were graded using a method based on a scale of 1 to 3. Grade 1 chickens were found to be most attractive to consumers, and Grade 3 chickens, were found to be the least attractive. The scale was derived from the six parameters listed below.

- (I) How close are the thighs or legs to the breast?
- (II) How plump and high does the breast appear?
- (III) How close are the legs to the tail?
- (IV) Is there any tenting (i.e. unsightly taut skin between the breast and leg, leading to skin splitting)?
- (V) Are the hocks crossed?
- (VI) Is the plug visible?

Grade 1 chickens had (I) thighs which were held tightly to the breast, (II) a high plump breast, (III) legs which were held close to the tail, (IV) no tenting or splitting, (V) crossed hocks and (VI) no sign of the plug.

Grade 2 chickens had (I) thighs spaced slightly apart from the breast, (II) a moderate plump breast, (III) legs which were not held closely to the tail, (IV) some tenting but no splitting, (V) hocks which were adjacent but not crossed, and (VI) an invisible or partially visible plug.

Grade 3 chickens had (I) thighs splayed apart, and/or (II) a flat breast, (III) legs askew and positioned significantly apart from the tail, (IV) pronounced tenting and/or skin splitting, (V) hocks which were not touching, and/or (VI) a clearly visible and protruding plug.

The grades which were awarded to the chickens of Example 2 are listed in Table 1 below.

Table 1

Grade 1 (good)	Grade 2 (average)	Grade 3 (poor)
19	1	0

Comparative Example 1

Eight birds were trussed by traditional methods, using an elastic band to bind the legs of the bird to the tail. These birds were subjected to the same handling and cooking conditions as Example 3 above. The cooked birds were graded using the grading method of Example 3 and the results are shown in the Table 2 below.

Table 2

Grade 1 (good)	Grade 2 (average)	Grade 3 (poor)
3	4	1

A comparison of the results of Tables 1 and 2 shows how chickens trussed by the present invention are more attractive to consumers than chickens which are trussed by traditional methods.

#### Example 4

In this example, twenty birds were trussed in accordance with the preferred embodiment of the present invention. These birds were subjected to extensive jostling and handling before being loaded into a CONVOTHERM oven for roasting. The trusses showed resistance to damage during the handling and loading procedure.

The birds were cooked using a 70 minute cook cycle, and a core temperature of approximately 85.2°C was achieved.

Nineteen out of the twenty trusses were resistant to the high oven temperatures and remained intact throughout the cooking process.

The birds were graded using the method of Example 3 above. The results are shown in Table 3 below.

Table 3

Grade 1 (good)	Grade 2 (average)	Grade 3 (poor)
18	1	1

#### Comparative Example 2

Twenty-seven chickens were trussed by traditional methods using an elastic band to bind the legs of the bird

to the tail. These chickens were subjected to identical handling and cooking procedures as the chickens of Example 4 above. The chickens were graded in accordance with the method of Example 3 and the results are shown in Table 4 below.

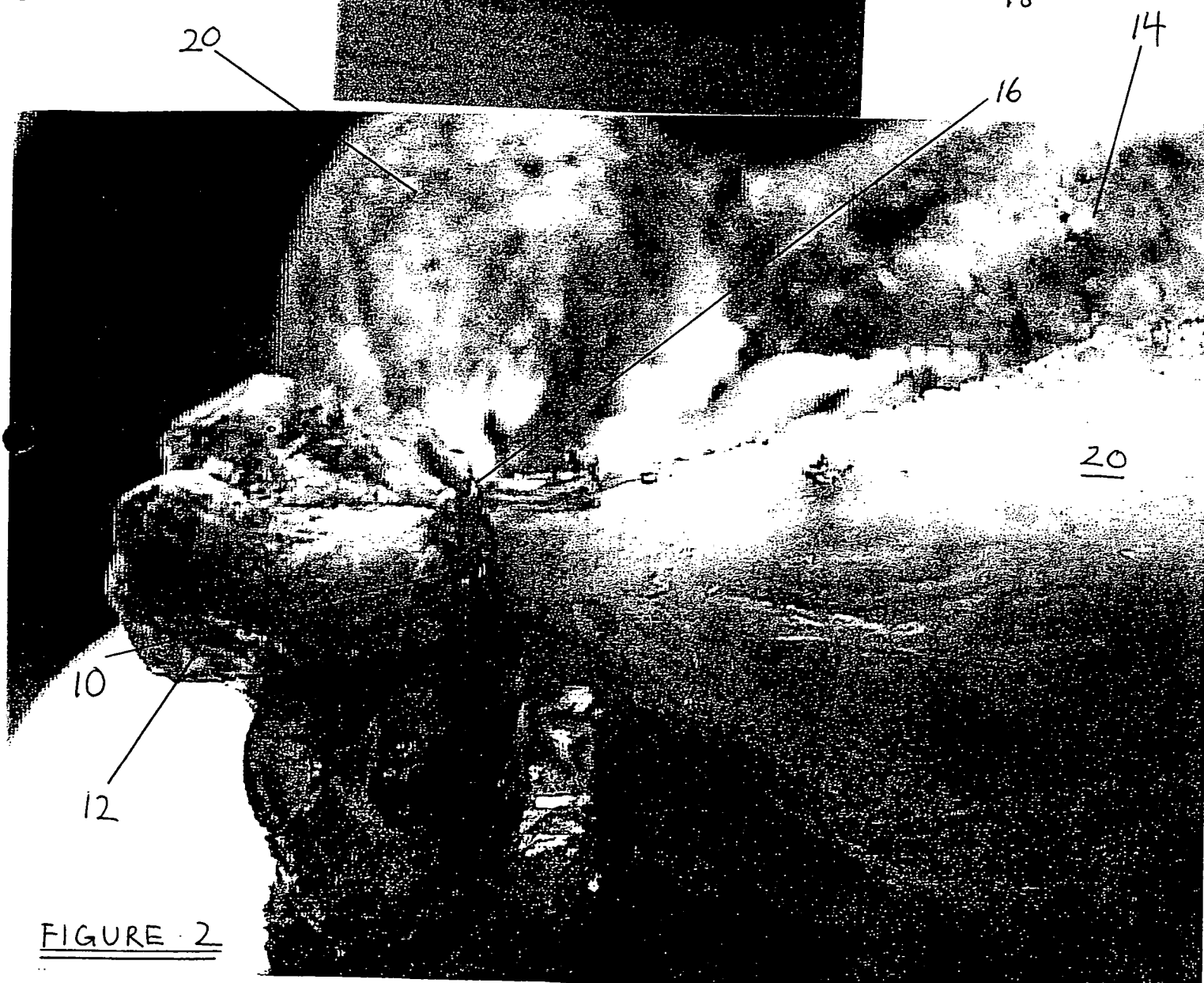
Table 4

Grade 1 (good)	Grade 2 (average)	Grade 3 (poor)
11	11	5

A comparison of Tables 3 and 4 confirms that chickens trussed by the present invention have better display characteristics and are more attractive to consumers than chickens which are trussed by traditional methods.

Various modifications may be made to the above described embodiment without departing from the scope of invention. For example, the truss 10 may be applied to any type of bird irrespective of size and configuration.



FIGURE 1FIGURE 2



212

112



FIGURE 3

100

110

100